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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARCO GIOVANARDI and EMANUELE BIANCHINI

Appeal 2008-005845
Application 09/916,360
Technology Center 2600

Decided[1]: August 04, 2009

Before JOSEPH F. RUGGIERO, ROBERT E. NAPPI, and KEVIN F. TURNER, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Final Rejection of claims 1, 3, 6-9, 11, 12, 15, and 18. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants' claimed invention relates to vibration damping, having active and passive damping components (Abstract). The active component, which may be a composed of piezoelectric material, is used to damp low frequency vibrations and the passive component, which may be composed of a viscoelastic material, is used to damp higher frequency vibrations (Spec. p. 8, ¶ [0036]).

Independent claim 1 is illustrative of the invention and reads as follows:

> 1. A device for reducing vibration in a section of material, said vibration causing an acoustic disturbance in a range of frequencies detectable by a target, the device comprising:
>
> an active damper comprising an electroactive element in electrical communication with an electrode, the active damper located a first distance from said section of material;
>
> a passive damper comprising a sound reducing material, said passive damper located a second distance from said section of material, wherein said second distance is greater than said first distance, and wherein at least one of the active damper and the passive damper reduces the magnitude of the acoustic disturbance reaching the target; and
>
> a constraining layer disposed in contact with said passive damper.

The Examiner relies on the following prior art references to show unpatentability:

Sasaki	US 5,261,200	Nov. 16, 1993
Bicos	US 5,315,203	May 24, 1994
Baz	US 5,485,053	Jan. 16, 1996
Silverman	US 6,501,644 B1	Dec. 31, 2002
Fuller	US 6,700,304 B1	Mar. 2, 2004
Worrell	US 2002/0092699 A1	Jul. 18, 2002

Claims 1, 3, 6, 9, 12, and 18 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Fuller.

Claims 1, 7, 9, 15, and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bicos.

Claims 1, 7, 8, 9, 15, and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Baz.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller and Sasaki.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller, Sasaki, and Silverman.

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller and Worrell.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bicos and Silverman.

ISSUES

Appellants contend that the Examiner's rejections are in error for several reasons. Appellants also argue that Fuller fails to teach both a passive damper and a constraining layer in contact with the passive damper, as recited in the independent claims and that the piezoelectric element in Bicos fails to constitute an active damper as recited in the independent claims (App. Br. 5-7; Reply Br. 5-8). Appellants also argue that Baz fails to teach an active damper, an active damper in addition to a constraining layer nor an actuator damping specific sound modes (App. Br. 7-9; Reply Br. 8-10). Appellants further argue the obviousness rejections are improper for

the same reasons as the anticipation rejections of claim 1 (App. Br. 9-11; Reply Br. 10-12).

The Examiner finds that composite structure in Fuller implicitly recites both damping and constraining layers and that the piezoelectric element in Bicos contributes to the damping functions of that device (Ans. 12-14). Additionally, the Examiner finds that Baz discloses a constraining layer in combination with an active damper (Ans. 15-16).

Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived. *See 37* C.F.R. § 41.37(c)(1)(vii).

Thus, the issues arising from the respective positions of Appellants and the Examiner are:

(i) Have Appellants shown reversible error in that Fuller fails to teach both a passive damper and a constraining layer, or like elements, per independent claims 1 and 18?

(ii) Have Appellants shown reversible error in that Bicos fails to teach an active damper, or like elements, per independent claims 1, 15, and 18?

(iii) Have Appellants shown reversible error in that Baz fails to teach both an active damper and a constraining layer, or like elements, per independent claims 1, 15, and 18?

(iv) Have Appellants shown reversible error in that claims 7, 8, and 11 were improperly rejected because all of the elements of independent claim 1 were not taught or suggested by cited references?

FINDINGS OF FACT (FF)

1. The instant Specification details a device for vibration damping, having active and passive damping components. The active component (201), which may be a composed of piezoelectric material, is used to damp low frequency vibrations and the passive component (205), which may be composed of a viscoelastic material, is used to damp higher frequency vibrations. A constraining layer (210) may be attached to the passive component and the assembly can be attached to a structure (215) to reduce acoustic disturbance detectable by a target (Abstract; Spec. p. 8, ¶ [0036]; Fig. 2, elements 201, 205, 210, 215).

2. Fuller is directed to an active/passive absorber having an active elastic layer (14), that may be formed from a piezoelectric ceramic, and a distributed mass layer (16), that may be comprised of lead or other materials (Abstract; Col. 4, ll. 20-46; Fig. 1).

3. Fuller describes that the absorber is not limited to a two layer system, but may have multiple layers, with at least one active elastic layer and at least one mass layer (Col. 4, ll. 55-60).

4. Fuller describes the mass layer as be composed of thin sheets of material, such as lead, steel, aluminum, composite fiberglass material and the like (Col. 4, ll. 43-51).

5. Bicos discloses an apparatus for passive damping of a structure (110), having a piezoelectric layer (114) oppositely coupled to a constraining piezoelectric element (112), sandwiching a visco-elastic material layer (116) (Col. 5, ll. 22-37; Fig. 4).

6. By virtue of the opposite coupling of piezoelectric elements in Bicos (FF 5), it is inherent that specific sound modes will be damped based on the material properties of the piezoelectric elements.

7. Baz discloses a device for active constrained layer damping for vibration and sound control, for a surface (20) having a stack of a piezoelectric sensor (40), a visco-elastic layer (10) and a piezo-constraining layer (50). A control signal obtained from the piezoelectric sensor is used to control the piezo-constraining layer in such a way to suppress structural vibrations and/or sounds (Col. 2, ll. 30-42, 47; Fig. 3).

8. It is inherent that specific sound modes will be damped based on the material properties of the piezoelectric elements in Baz.

PRINCIPLES OF LAW

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988).

> [T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness' . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

During examination, the claims must be interpreted as broadly as their terms reasonably allow. *In re Am. Acad. of Sci. Tech Center*, 367 F.3d 1359, 1369 (Fed. Cir. 2004). When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989). "Even when guidance is not provided in explicit definitional format, the specification may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005)(citations and internal quotation marks omitted).

ANALYSIS

I. Anticipation by Fuller

Claims 1, 3, 6, 9, 12, and 18

Appellants argue the 'several thin sheets of lead stacked on top of each other' that are described as a distributed mass layer' in Fuller cannot constitute both a passive damper and a constraining layer (App. Br. 5). Appellants also argue that in the context of the instant Specification and the cited references, the meaning of "constraining layer" is clear and is not met by the several thin sheets of lead in Fuller (*Id.*). The Examiner finds that the prior art and the present application disclose different types of constraining layers such that the term "constraining layer" is not limited to a particular type of constraining layer (Ans. 13). The Examiner also finds that the several thin sheets of material in Fuller teach both a passive damper and a

constraining layer, per the independent claims (Ans. 13). We generally agree with the Examiner.

It seems clear that at least one of the sheets of lead or other material in Fuller can act as a passive damper, and at least one other sheet can act as a constraining layer (FF 3, 4). As recited in independent claims 1 and 18, the constraining layer is not recited as having properties other than constraining and being in contact with the passive damper or damping means. Appellants do not cite to specific structures in the Specification for the restraining means of claim 18, other than the constraining layer 210 (App. Br. 4). Appellants have not shown how the outermost sheet in Fuller would not constrain or be in contact with inner sheets. Appellants do not contest that the inner sheets can act as a passive damper. As such, we find no error in the Examiner's reading of the passive damper and constraining layer, or passive damping means and constraining means, on the structure disclosed in Fuller.

II. Anticipation by Bicos

Claims 1, 7, 9, 15, and 18

Appellants argue that Bicos fails to teach an active damper or active damping means in combination with a constraining layer or constraining means (App. Br. 6). Appellants further argue that the piezoelectric material (12) in Bicos operates as a constraining layer and the inner piezoelectric element (14) operates solely as a sensor and does not function as an active damper (*Id.*). With respect to claim 15, Appellants argue that the inner piezoelectric element (14) does not actively damp specific sound modes (App. Br. 7). The Examiner finds that the inner piezoelectric element (14,

and equivalent elements in other embodiments) contributes to the damping functions of the device in Bicos, including specific modes (Ans. 14). We generally agree with the Examiner.

Given the opposite coupling of the piezoelectric elements in most of the embodiments disclosed in Bicos (FF 5), either layer can act as a "sensor" for the other layer to actively damp to reduce the magnitude of an acoustic disturbance. In other words, both piezoelectric elements act to actively damp vibrations, including specific sound modes (FF 6). Nothing in the independent claims requires that the constraining layer or means cannot also contribute to reducing vibrations. As such, we do not find Appellants' arguments to be compelling and find no error in the rejection.

III. Anticipation by Baz

Claims 1, 7-9, 15, and 18

Appellants argue that Baz fails to teach an active damper or active damping means in combination with a constraining layer or constraining means (App. Br. 8). Appellants further argue that the piezoelectric material (50) in Baz operates as a constraining layer and the other piezoelectric element (40) operates solely as a sensor and does not function as an active damper (*Id.*). With respect to claim 15, Appellants argue that the other piezoelectric element (50) does not actively damp specific sound modes (*Id.*). The Examiner finds that without the other piezoelectric element (40), the device of Baz cannot perform a damping function in general or damping of specific modes (Ans. 15-16). We generally agree with the Examiner.

As discussed *supra* with respect to Bicos, we find that either piezoelectric layer in Baz can act to actively damp vibrations, including

specific sound modes (FF 7, 8). Claim 1, for example only requires "at least one of the active damper and the passive damper reduces the magnitude of the acoustic disturbance reaching the target," and only requires an electrode to be in electrical communication with the active damper. In other words, the active damper need not be electrically controlled for the device to function as required. Similarly, with respect to claim 15, the piezoelectric sensor in Baz damps specific sound modes (FF8). With respect to claim 18, the piezoelectric sensor in Baz is activated and is used to damp low frequency vibration. We do not find the independent claims to require more. As such, we do not find Appellants' arguments to be compelling and find no error in the rejection.

IV. Obviousness over Fuller, Bicos, Sasaki, Silverman & Worrell Claims 7, 8, and 11

With respect to the rejection of dependent claims 7, 8, and 11, the Examiner relies upon Sasaki, Silverman and Worrell to render obvious specific elements recited in those dependent claims. Appellants argue that the dependent claims all depend from independent claim 1, where Fuller and Bicos were argued as not teaching or suggesting all of the elements of independent claim 1, and the rejections of those dependent claims should likewise be reversed (App. Br. 9-11). However, as discussed *supra*, we find no error in the rejections of claim 1 and similarly find no error in the rejections of claims 7, 8, and 11.

CONCLUSION

The decision of the Examiner rejecting claims 1, 3, 6, 9, 12, and 18 under 35 U.S.C. § 102(e) based on Fuller, claims 1, 7, 9, 15, and 18 under 35 U.S.C. § 102(b) based on Bicos, claims 1, 7, 8, 9, 15, and 18 under 35 U.S.C. § 102(b) based on Baz, claim 7 under 35 U.S.C. § 103(a) over Fuller and Sasaki, claim 8 under 35 U.S.C. § 103(a) over Fuller, Sasaki, and Silverman, claim 11 under 35 U.S.C. § 103(a) over Fuller and Worrell, and claim 8 under 35 U.S.C. § 103(a) over Bicos and Silverman, is affirmed.

DECISION

The Examiner's rejection of claims 1, 3, 6-9, 11, 12, 15, and 18 before us on appeal is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

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